REMARKS

This amendment responds to the Final Office Action mailed May 3, 2006. In the Final Office Action the Examiner:

- rejected claims 15-19 under 35 U.S.C. 102(b) as anticipated by Lanziner (EP 0 325 539 A1);
- rejected claim 20 under 35 U.S.C. 103(a) as being unpatentable over Lanziner (EP 0 325 539 A1) in view of Link et al. (US 5,572,427);
- rejected claims 21-22 and 28 under 35 U.S.C. 103(a) as being unpatentable over Lanziner (EP 0 325 529 A1) in view of Fukae et al. (EP 0 961 134 A1);
- rejected claims 23 and 26-27 under 35 U.S.C. 103(a) as being unpatentable over Lanziner (EP 0325 539 A1) in view of Fukae et al. (EP 0 961 134 A1) and Holt (US 6,608,593);
- rejected claim 25 under 35 U.S.C. 103(a) as being unpatentable over Lanziner (EP 0 325 539 A1) in view of Fukae et al. (EP 0 961 134 A1) and Holt (US 6,608,593) as applied to claim 23, and further in view of Lamensdorf et al. (US 20040008153A1); and
- objected to claim 24 as being dependent on a rejected claim.

After entry of this amendment, the pending claims are: claims 23-25 and 32-44.

Overview of Changes to Claims

Claim 23 has been amended to include the limitations of originally filed claim 15 (i.e., excluding revisions to claim 15 made during earlier amendments). Claims 1-15, and 26-31 have been cancelled. New claims 32-44 have been added. New claim 32 combines the limitations of originally filed claims 15 and 21. New claims 33-37 are based on the combination of originally filed claims 15, 21 and portions of originally filed claims 16-20, and 22-28, respectively. Support for the new claims is found at least in Figures 6 and 7A-7C, the corresponding text in the specification, and the originally filed claims. These changes, therefore, do not constitute new matter.

Detailed Response 35 U.S.C. 102(b)

In the present Office Action the Examiner has rejected claims 15-19 as anticipated by Lanziner. In light of cancellation of Claims 15-19, this rejection is moot. Removal of this ground for rejection is requested.

Detailed Response 35 U.S.C. 103(a)

In the present Office Action the Examiner has rejected claim 20 as anticipated by Lanziner in view of Link. In light of cancellation of claim 20, this rejection is moot. Removal of this ground for rejection is requested.

Claims 32-44

In the present Office Action the Examiner has rejected claims 21-22 and 28 as anticipated by Lanziner in view of Fukae. The Applicants disagree and traverse.

As noted above, new claim 32 combines the limitations of cancelled claims 15 and 21. Thus, the rejection of claim 21 is assumed to apply to new claim 32 and will be addressed with respect to new claim 32.

As noted by the Examiner on page 4 of the present Office Action, Lanziner is silent about transmitting the pulse at a first position of the device and determining from the received return signal a first set of range candidates, each range candidate representing a possible range to the reflecting landmark; transmitting the pulse at a second position of the device and determining from the received return signal a second set of range candidates; and processing the first and second sets of range candidates to produce a reduced set of range candidates that are consistent with one or more potential reflecting landmark positions. Therefore, Lanziner fails to teach, disclose or reasonably suggest all of the limitations of claim 32.

Further, and contrary to the assertion of the Examiner, Fukae et al. do not teach, disclose, or reasonably suggest the limitations of claim 32.

First, Fukae et al. do not teach, disclose or reasonably suggest "a ***passive***, isotropic reflecting landmark at a fixed position" (see claim 32). In Fukae et al., a vehicle mounted system transmits an optical or electrical signal to a data station or transponder. The transponder transmits a responding optical or electrical reply signal to the vehicle mounted system. The distance between the system and the transponder is calculated, and using

triangulation methods the position of the vehicle on a roadway can be ascertained. Thus, the transponders in Fukae et al. are ***active*** devices that transmit data in response to an interrogation signal by a positioning device. Therefore, Fukae et al. do not teach, disclose or reasonably suggest "a passive, isotropic reflecting landmark at a fixed position" as disclosed in claim 32.

Secondly, Fukae et al. fail to teach, disclose, or reasonably suggest any of the following limitations in claim 32:

> **determining . . . a first set of range candidates,**
>
> **determining . . . a second set of range candidates[,]**

or

> **processing the first and second sets of range candidates to produce a reduced set of range candidates that are consistent with one or more potential landmark positions.**

As disclosed in claim 32, "each range candidate represents a ***possible*** range to the reflecting landmark." However, the system in Fukae et al. determines the distance between the vehicle and the transponder from a single interrogation and response without determining "possible ranges." The receiver in Fukae et al. knows that the signal it is receiving is from a particular transponder (*See* Fukae et al. at col. 12, lines 55-58) with a known unambiguous location (*See* Fukae et al. at col. 11, lines 38-39) and "the speed of propagation of an optical or electromagnetic signal is well known" (Fukae et al. at col. 11, lines 22-24), and thus "the distance ... between the [receiver] and the [transponder] ... may easily be determined" (Fukae et al. at col. 11, lines 26-30). Therefore, the system in Fukae et al. does not produce a first set of range candidates, let alone a second set of range candidates or even a reduced set of range candidates.

Accordingly, neither Lanziner, Fukae et al., nor their combination disclose, teach or reasonably suggest all of the limitations of claim 32, and thus claim 32 is not *prima facie* obvious. For example, neither Lanziner, Fukae et al., nor their combination disclose, teach or reasonably suggest any of the following: determining a first set of range candidates based on the return signal for a pulse transmitted at a first position; determining a second set of range candidates based on the return signal for a pulse transmitted at a second position; and processing the first and second sets of range candidates to produce a reduced set of range candidates. The range candidate reduction methodology used by the system of claim 32 is

contrary both to the teachings and to the context of Lanziner, of Fukae et al. and or any reasonable combination thereof. Removal of this ground for rejection is requested.

New claims 33-44 are dependent upon claim 32 and are patentable for at least the same reasons as claim 32 and for the additional limitations called for therein.

Claim 44

For example, with respect to claim 44 (corresponding, in part, to canceled claim 28), neither Lanziner nor Fukae et al. teach

> **combining ... resulting return signals to produce a representative return signal,**

and, furthermore, neither Lanziner nor Fukae et al. teach

> **processing the representative return signal to produce a set of range candidates** ....

Fukae et al., in particular, fails to teach, disclose, or suggest these limitations for one simple reason: the operating principles of the system in Fukae et al. are fundamentally different than the operating principles of the present application.

While the system of claim 42 includes landmarks at known locations, the system is specially designed to distinguish the reflection of a passive landmark from the reflection of other objects surrounding the positioning device. One way of doing so (as taught in the pending application, and claimed in claim 42) is to repeat the transmitting and receiving of an electromagnetic pulse a number of times, combine the resulting return signals to produce a representative return signal, and process the representative return signal to produce a set of range candidates that are consistent with one or more potential landmark positions. As explained in the specification in paragraphs 0043-0044 (which are paragraphs 0060-0061 in the published application), one way of combining the resulting return signals is to average them. Using the averaged representative return signal, the system will be better able to discriminate between pulses reflected from landmarks and pulses reflected from clutter objects.

In Fukae et al., a vehicle mounted system transmits an optical or electrical signal to a data station or transponder. The transponder transmits a responding optical or electrical reply signal to the vehicle mounted system. The distance between the system and the transponder is calculated, and using triangulation methods the position of the vehicle on a roadway can be

ascertained. The following passage from Fukae et al., paragraphs 0041-0042, helps clarify the system (emphasis added):

> The vehicle 4 transmits and receives two sets of optical/electrical signals communicatively with a single transponder 44j. . . . [T]he transmitter/receiver 12, 14 of the vehicle 4 transmits an optical or electromagnetic interrogation signal along transmitted path T1 to transponder 44j, which sends a response optical or electromagnetic signal along received path R1 to the receiver 14. After a known time delay τ, transmitter 12 transmits a second optical or electromagnetic interrogation signal along path T2 toward the same transponder 44j, which sends a response optical or electromagnetic signal along received path R2 to the receiver 14. The first and second response signals sent from transponder 44j to the receiver 14 are substantially identical.
>
> As discussed above, . . . since the speed of propagation of an optical or electromagnetic signal is well known, the distance that the optical or electromagnetic signal travels may be determined by a triangulation method. Thus, the distance L1 between the vehicle mounted system 12 and the transponder 44j at a time t1 and the distance L2 between the vehicle mounted system 10 and the transponder 44j at time t2 may easily be determined. In addition, because the time τ between sending/receiving the first, and second signals is known, and the velocity V of the vehicle 4 is known, the distance L3 that measures the distance of the vehicle 4 between communication of the two sets of signals may be calculated as vehicle speed V multiplied by time z. Once lengths L1, L2 and L3 are calculated, then **the position of vehicle 4 at times T1 and T2 can be determined using triangulation methods** since the location of 44j is unambiguously known. Accordingly, the location of a vehicle 4 moving along the roadway 2 can be determined by the system of the present invention, even when the angles of communication between the transmitter 12/receiver 14 and a transponder 44 are unknown.

As can be seen from the above, Fukae et al. teaches the double transmission and receiving by a vehicle of an interrogation signal and a response signal to and from a transponder to allow for *triangulation*, not to *combine a plurality of return signals to produce a representative return signal*. The system in Fukae et al. can determine the distance between the vehicle and the transponder from a *single interrogation and response*. This is because the receiver in Fukae et al. knows that the signal it is receiving is from the transponder, and further knows which transponder sent the response signal. *See* Fukae et al. at col. 12, lines 55-58. The

receiver in Fukae et al. sends a second interrogation because unambiguously knowing the distance between the transponder and the receiver is not enough to unambiguously determine the location of the vehicle along a roadway, since two or more locations along the roadway can be at a given distance from the transponder. Therefore, the second interrogation signal sent by the vehicle is used to *triangulate*, not to *combine* with the first signal. Furthermore, Fukae et al. does not teach, disclose, or suggest *processing the representative return signal to produce a set of range candidates*, because the range, i.e., distance, to a unique, specific transponder is unambiguously known.

Claims 23-25, 39

In the present Office Action the Examiner has rejected claims 23 and 26-27 as anticipated by Lanziner in view of Fukae and Holt. The Applicants disagree and traverse.

The Examiner alleges that Lanziner and Fukae et al. disclose all claim limitations except "transmission of the pulse having a respective transmission beam pattern with a null over a different respective range of angles." *See* Office Action mailed 5/3/06 at page 6. However, as explained above with respect to claim 32, neither Lanziner, Fukae et al., nor their combination disclose, teach or reasonably suggest

determining from the return signals from the multiple pulse transmissions a first set of range candidates,

let alone a reduced set of range candidates, as called for in claim 23. Additionally, Holt fails to disclose "determining ... a first set of range candidates" or producing a reduced set of range candidates, as required by claim 23. Holt discloses the use of multilateration calculations to determine the location of a transmitter, by comparing the known or calculated location of proxy receivers, i.e., known natural or manmade reflecting or refracting objects, and the estimated time of arrival of the signal at the proxy receiver. *See* Holt, col. 4, lines 40-57. Holt does not determine a set of range candidates because the signal received by the receiver is known to have originated from the transmitter. Rather, in Holt, the receiver receives the same signal from what is known to be the transmitter, but through multiple paths. Holt teaches a method and system that uses this multiple path environment, usually a source of error, to help locate the transmitter.

Since Holt does not teach determining a set of range candidates, it also does not teach

each range candidate having an associated range of angles,

as required by claim 23.

Therefore, for each of reasons discussed above, neither Lanziner, Fukae et al., Holt, nor their combination disclose, teach or reasonably suggest all of the limitations of claim 23.

Further, and contrary to the assertion of the Examiner, Holt does not teach, disclose, or reasonably suggest

a null over a different respective range of angles,

as required by claim 23. Holt discloses that "[t]he inputs may include... Angle of Arrival." Holt, col. 4, lines 31-36. Holt further discloses "[i]t is presumed that nulling of paths would be used to remove impacts of other paths on the arriving path," and "[f]or a four-element system, the system could place nulls on three other paths" (emphasis added). Holt, col. 18, lines 47-55. However, the mere use of the terms "angle" and "nulling" in the same specification does not teach "a transmission beam pattern with a null over a different respective range of angles[,]" as recited in claim 23. At most, Holt teaches nulling a subset of the directional receiving antennas in a receiver so as to avoid receiving multipath signals, and thus the only use of the term "nulling" by Holt concerns a signal receiving technique, not a signal transmission technique. Therefore, for this additional reason, neither Lanziner, Fukae et al., Holt, nor their combination disclose, teach or reasonably suggest all of the limitations of claim 23.

Accordingly, neither Lanziner, nor Fukae et al., nor Holt, nor their combination disclose, teach or reasonably suggest all of the limitations of claim 23, and thus claim 23 is not *prima facie* obvious. Removal of this ground for rejection is requested.

The above explanations with respect to claim 23 are equally applicable to new claim 39.

Claims 26-27 have been cancelled, and thus the rejection to those claims is moot.

In the present Office Action the Examiner has rejected claim 25 as anticipated by Lanziner in view of Fukae and Holt and Lamensdorf. The Applicants disagree and traverse.

Claim 25 is dependent upon claim 23 and is patentable for at least the same reasons as claim 23 and for the additional limitations called for therein. Removal of this ground for rejection is requested.

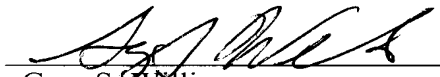
The Applicants note that the Examiner has used several combinations of different references in an attempt to achieve the limitations of the pending claims. The Applicants note that the Examiner has not provided either explicit or implicit teachings or suggestions in the prior art cited in the combinations or in the knowledge generally available to one of ordinary skill in the art that motivated these combinations. In the present Office Action, the Examiner alludes to the latter (p. 5, lines 5-8), but has not provided any evidence to substantiate this assertion. The Examiner appears, therefore, to be taking official notice of such motivations. The Applicants herewith request that Examiner provide substantiating evidence. In the absence of such evidence, it would appear that the Examiner has used impermissible hindsight as the motivation for these combinations. And in the absence of motivations, the combinations are not *prima facie* obvious. Removal of these grounds for rejection is requested.

CONCLUSION

In light of the above amendments and remarks, the Applicant respectfully requests that the Examiner reconsider this application with a view towards allowance. The Examiner is invited to call the undersigned attorney at (650) 843-7501, if a telephone call could help resolve any remaining items.

Respectfully submitted,

Date: January 2, 2007



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